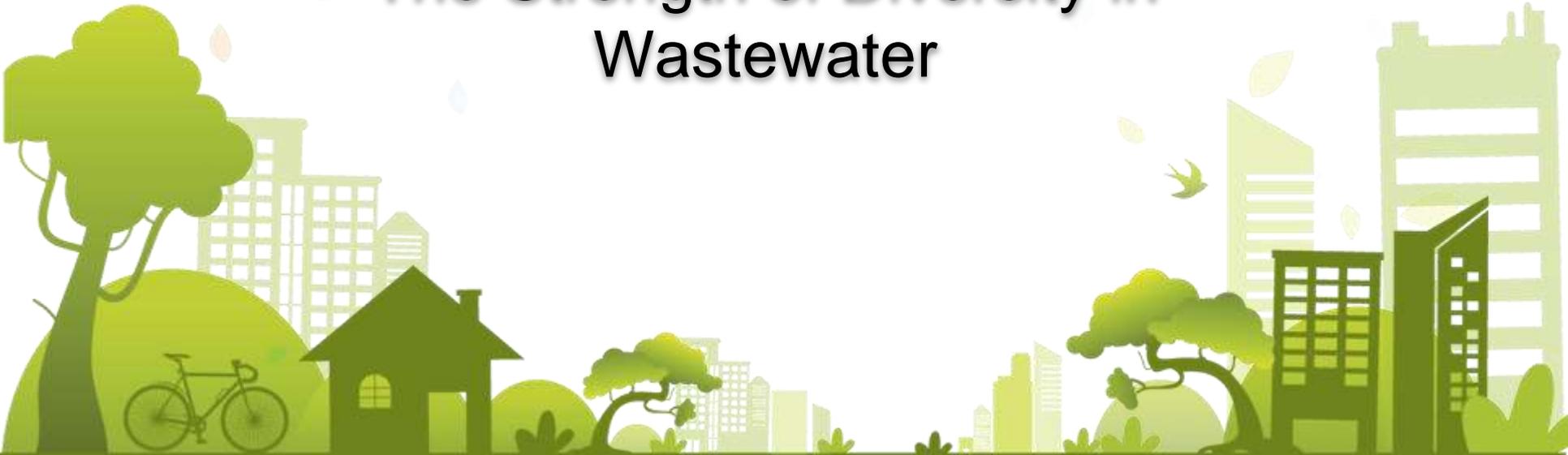


# How to get more Mix in your Mixed Liquors

The Strength of Diversity in  
Wastewater



# HELLO!

## Nate Tillis

Maintenance Supervisor Waukesha CWP

Operator-In Charge Sullivan Sanitary  
District #1

Senior VP Hall of Fame Athletics

Founding member of SoJuRN (Social  
Justice Right Now)

## Tonia (Speener)

Westphal, PE, LEED AP

## Clark Dietz, Inc.

Northern Wisconsin Area Manager

# Agenda

1. What is diversity?
2. The state of diversity in the field of water.
3. Why is it important?
4. What are the benefits?
5. Flint, MI Case Study
6. What can you do?

# what is diversity?

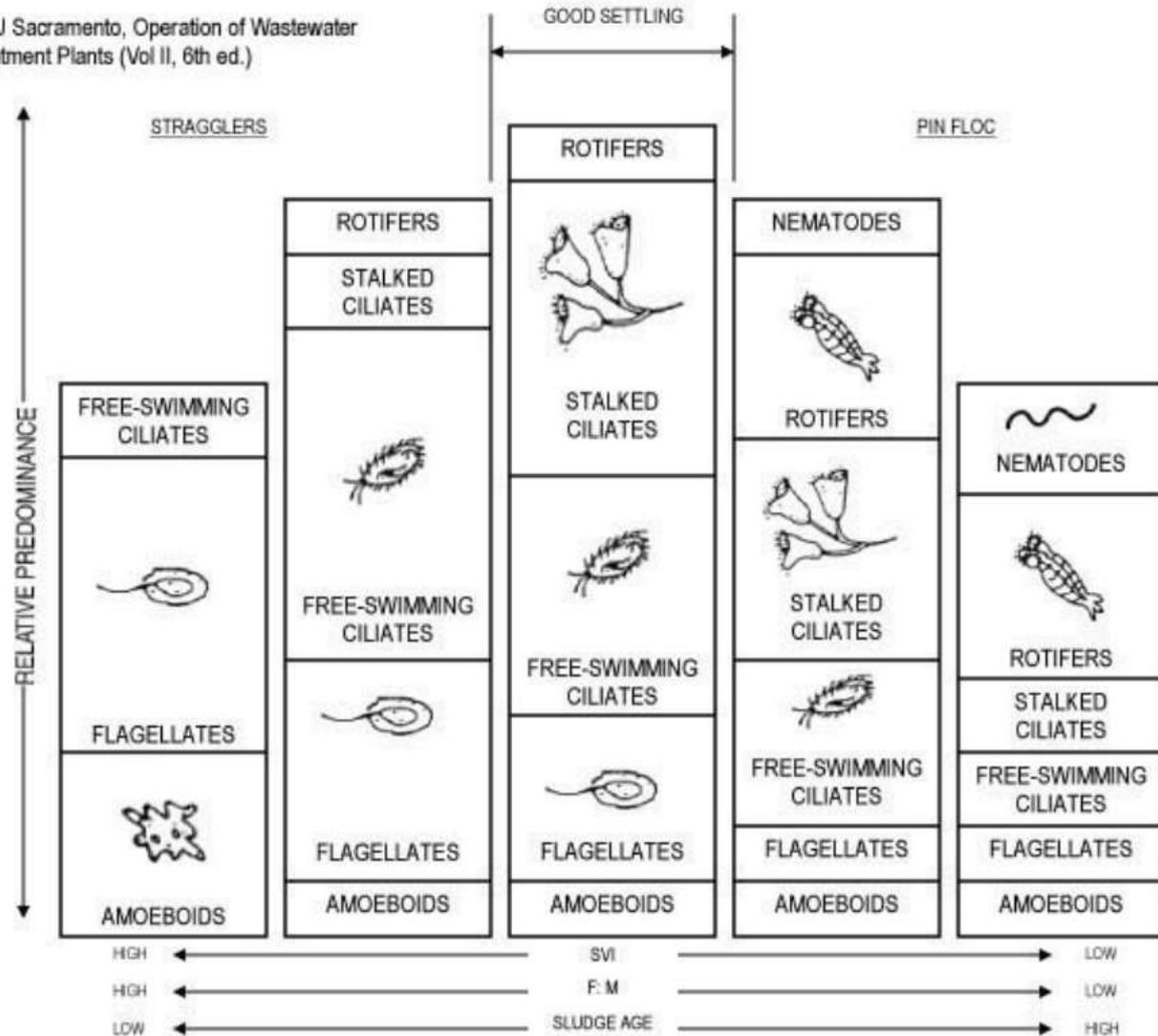


Diversity is the variability among living organisms from all sources and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems.



# Wastewater needs diversity in organisms for optimal treatment

Courtesy of CSU Sacramento, Operation of Wastewater Treatment Plants (Vol II, 6th ed.)





The concept of diversity encompasses acceptance and respect.

It means understanding that each individual is unique, and recognizing our individual differences. These can be along the dimensions of race, ethnicity, gender, sexual orientation, socio-economic status, age, physical abilities, religious beliefs,

political beliefs, or other ideologies. It is the exploration of these differences in a safe, positive, and nurturing environment.

It is about understanding each other and moving beyond simple tolerance to embracing and celebrating the rich dimensions of diversity contained within each individual

# Types of Diversity

Age

Education

Racial

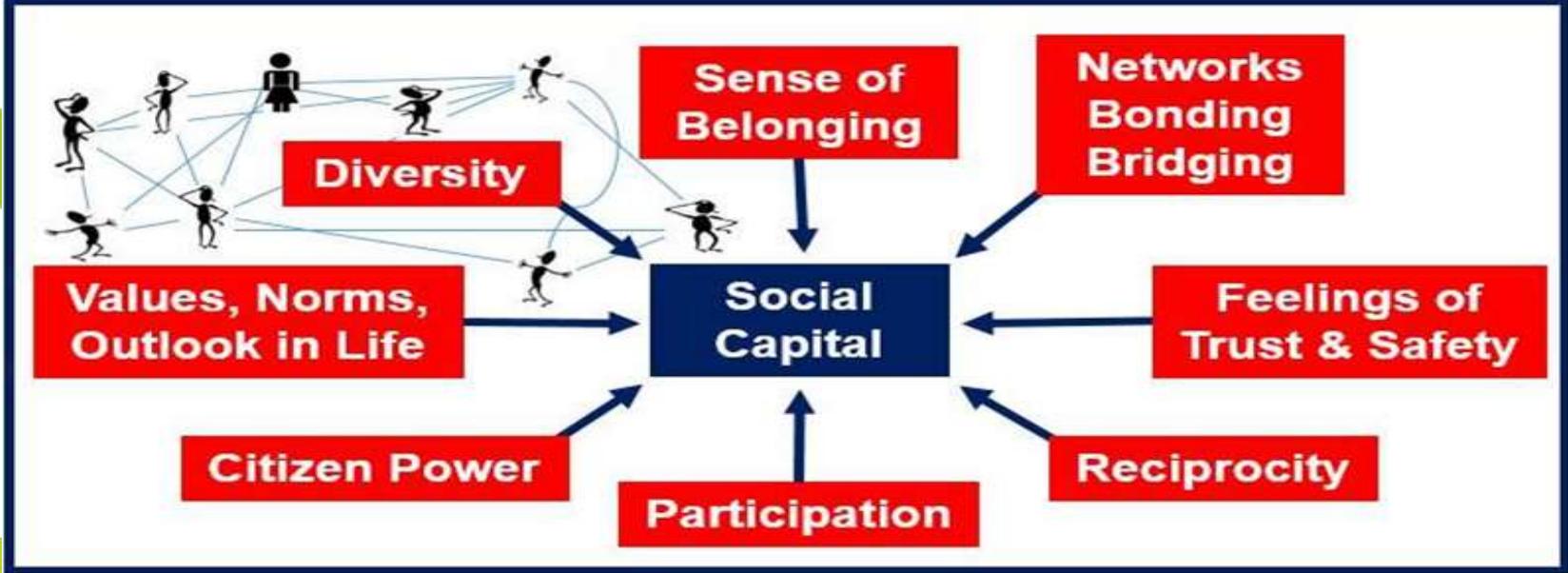
Socio-economic

Sex/Gender

Background



# Social Capital



# By the numbers...

Nearly **1.7** million workers fill jobs in utilities, construction firms, and numerous other employers across the water sector

water workers, including water treatment operators, are almost four years older than the national median age (42.2 years old) across all occupations

women make up only 14.9 percent of the water workforce, compared to 46.8 percent of all workers nationally;

black and Asian workers only represent 11.5 percent of the water workforce, compared to 18 percent of all workers nationally

water sector pay well — not only on average — but also up to 50 percent more to workers at the lower end of the income scale

Just 10.2 percent of water workers are under the age of 24, compared to 12.5 percent of all workers nationally

BLS also projects water occupations to see faster overall employment growth (9.9 percent) compared to all occupations nationally (7.4 percent) between 2016 and 2026.

# ...and by the dollars.

The water workforce in

## Milwaukee-Waukesha-West Allis, WI

Select a metro area

Milwaukee-Waukesha-West Allis, WI

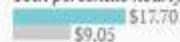
### Metro area water employment, 2016

**7,644**

Rank: 44/100

### Hourly wage distribution of the water workforce (■) versus all occupations (■), 2016

#### 10th percentile hourly wage



#### 25th percentile



#### 50th percentile



#### 75th percentile



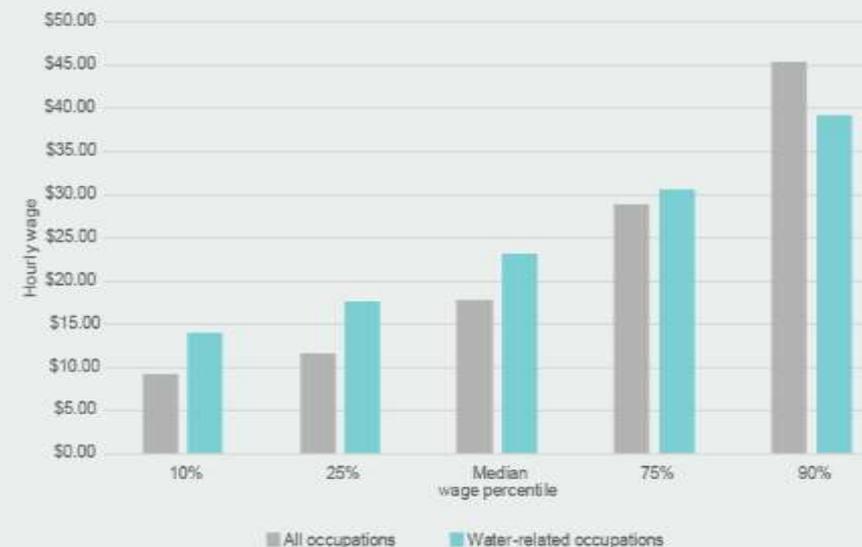
#### 90th percentile



### Ten largest water occupations by employment, 2016

Occupation	Jobs in water workforce	Share of all water workforce jobs
1. Plumbers, Pipefitters, and Steamfitters	1,355	17.7%
2. Construction Laborers	479	6.3%
3. Office Clerks, General	395	5.2%
4. Operating Engineers and Other Construction Equipment Operators	394	5.2%
5. Water and Wastewater Treatment Plant and System Operators	360	4.7%
6. Heating, Air Conditioning, and Refrigeration Installers		
7. First-Line Supervisors of Construction Workers		
8. Helpers-Pipefitters, Plumbers, Steamfitters, and Construction Laborers		
9. Heavy and Tractor-Trailer Drivers		
10. Sheet Metal Workers		

### U.S. Hourly Wage Comparison: Water Occupations vs. All Occupations, 2016



Source: Brookings analysis of BLS Occupational Employment Statistics


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 Over 50 Years of  
 Extreme Conditions  
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[Baby Boomer Retirements Leave a Widening Employment Gap in Water Sector](#)

## Baby Boomer Retirements Leave a Widening Employment Gap In Water Sector

Now retiring after 27 years as a water resources manager, Kathleen Cahill says they're having difficulty filling her position

By Giles Lambertson

August 13, 2018



**2019 tpo Instrumentation directory**


**DEDICATED TO SANITARY, SEWER & STORM WATER**  
[CLICK HERE FOR INFO](#)

[Online Exclusives](#)
[Why Young Workers Should Consider Jobs in the Water Sector](#)

## Why Young Workers Should Consider Jobs in the Water Sector

Renewing the nation's infrastructure will require a sizable workforce, and jobs in the water sector pay well

July 03, 2018



# Why is Diversity important?

How will my organization benefit from it?

Talent/Skills

Education, military, farming, machining, engineers. Years of experience, location, cultural, personality etc.. All contribute to different ways to tackle a problem

Candidate  
Pool

Extremely low unemployment and shortage of skilled trades candidates narrows the pool. Looking to more diverse candidates will expand the talent

Retention

Changing job market creates mobility in staff. A welcoming, and inclusive workplace encourages employees to stay and grow with organization

Performance

Higher morale and job satisfaction when allowed to express ideas; encourages managers to motivate employees in various ways

# Why is Diversity important? How will my organization benefit from it?

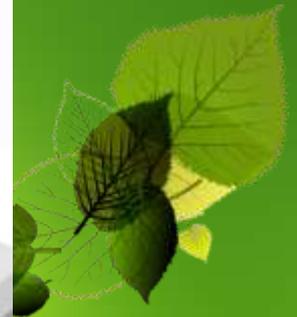


# Case Study: Flint, Michigan: What Happened and Why?



# Case Study: Flint, Michigan: The Facts

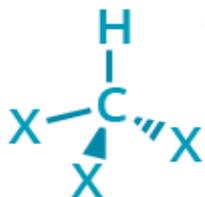
- Governor Snyder took office in 2011 and passed a tax break to corporations decreasing revenue for city. In 2014, Flint decided it was paying too much for water from Lake Huron by way of Detroit.
- They decided to construct their own pipe but would switch to a nearby lake in the interim
- The lake water alone was NOT contaminated
- An anti-corrosive was not added to the supply causing deterioration of lead pipes in homes



# Case Study: Flint, Michigan: The Facts

## THE FLINT WATER CRISIS

The American city of Flint, Michigan, has been in the news recently due to the discovery of very high levels of lead in its water supply. But how did this lead get there? Here's a brief explainer.



### TRihalOMETHANES

Disinfectant byproducts; formed by the reaction of chlorine (added to disinfect the water) with organic matter.

X = halogen (commonly Cl or Br)

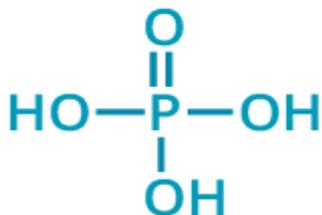
### CORROSION: DETROIT VS. FLINT RIVER

0.45 vs 1.60  
DETROIT vs FLINT

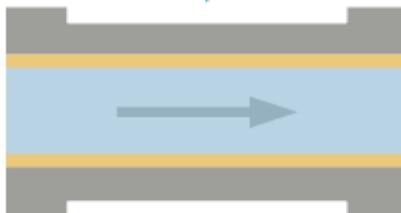
Chloride to sulfate mass ratio (CSMR);  
0.45 = low corrosion;  
1.60 = very high corrosion.

When high levels of trihalomethanes were detected in Flint's water, ferric chloride ( $\text{FeCl}_3$ ) was added to improve removal of organic matter. However, this increased the water's already high concentration of chloride ions, and as a result made the water more corrosive.

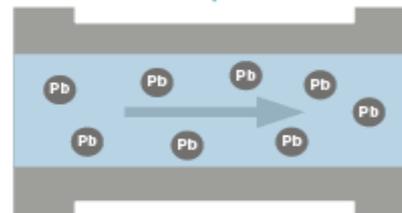
### CORROSION CONTROL



### WITH PHOSPHATES



### WITHOUT PHOSPHATES



Orthophosphates are added to water to reduce the amount of lead leaching into it from pipes. They do this by forming a layer of low-solubility lead-phosphate complexes inside the pipe. This method of corrosion control was not used for the Flint River water supply.

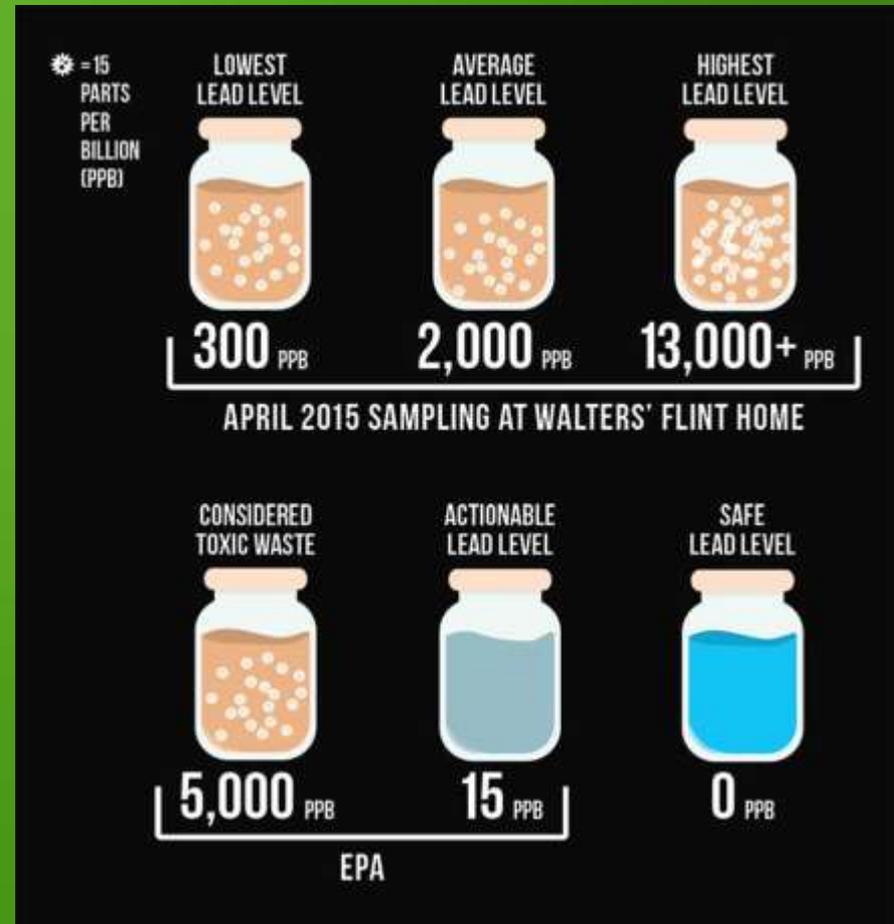


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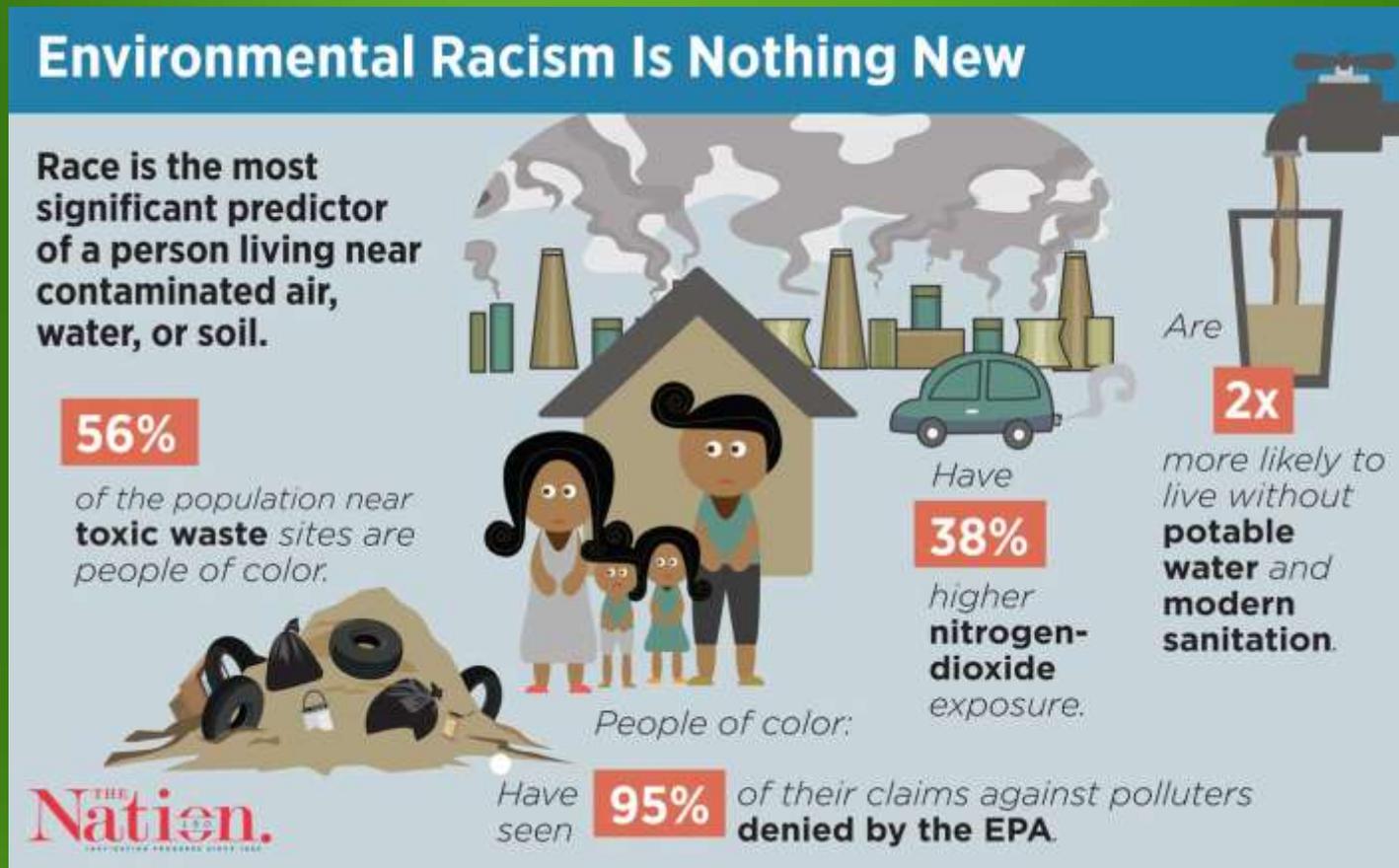
# Case Study: Flint, Michigan: The Facts cont'd

- GM complained about water quality and was switched back at the cost of the city
- At the same time residents complained but their source was not switched back.
- An independent study found lead at various levels in residences
- Residents were on the tainted water for more than 20 months
- At least 12 people died after more than 80 people were infected with Legionnaires' disease, which was also linked to the contaminated water.



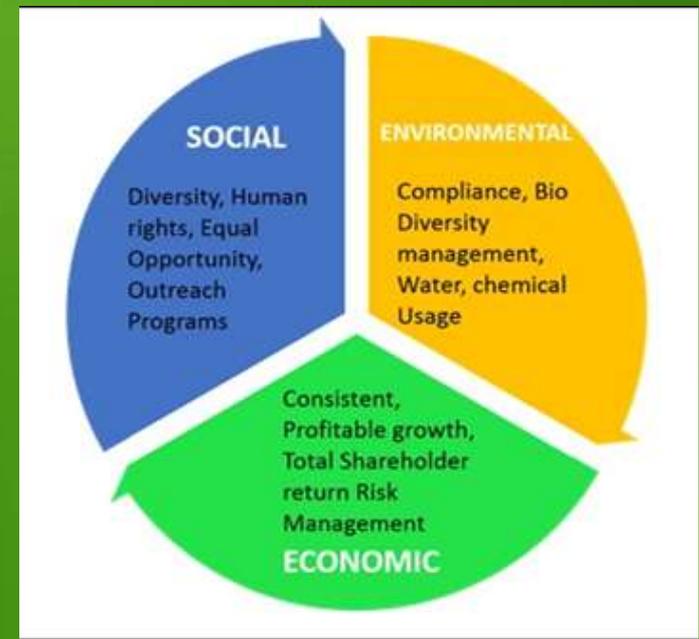
# Case Study: Flint, Michigan: The Facts

- The City of Flint, which has a population of around 100,000, is 57 percent black, 37 percent white, 4 percent Latino and 4 percent mixed-race.
- At least 41 per cent of residents live below the federal poverty level.
- median income of \$24,862.



# Case Study: Flint, Michigan: The Facts

- White flight to the suburbs contributed to today's situation in which a smaller and mostly black population struggles to maintain a water system built for a much larger city.
- Anti-corrosive additive would have cost about \$100/day
- "government, particularly state government, was slow to recognize the emergency," which "exacerbated the harm significantly."
- A government-appointed civil rights commission concluded there were not any specific violations of state civil rights laws, but says "historical, structural and systemic racism combined with implicit bias" played a role in the problems



# Case Study: Flint, Michigan: What Happened and Why?

*In the country's largest metro areas, where the working-population tends to be much more diverse but is often enduring high levels of poverty and unemployment.*

*From Detroit and St. Louis to Jacksonville and Orlando, for instance, thousands of water jobs are present, yet many residents, representing a variety of demographic and economic backgrounds, remain on the sidelines*



# How can we impact change?

Workforce Policy Changes

Federal/State Level

Local Level

Employer Driven Changes



# How can we impact change?

## MAJOR NEEDS IN WATER WORKFORCE DEVELOPMENT

- ✓ Acknowledge the varying scale and capacity of different communities—and utilities across urban and rural areas in particular—to expand the water workforce opportunity
- ✓ Emphasize that the water workforce needs greater public visibility, especially when trying to reach younger workers and other prospective job candidates
- ✓ Consider barriers to support a more diverse water workforce, including the importance of looking for talent in places that may not traditionally have attracted as much attention
- ✓ Investigate why identifying and hiring skilled workers remains a struggle for many utilities and other water employers, including the lack of proactive recruitment strategies

- ✓ Note the need for additional support, including
- ✓ Examine the development of

## EMPLOYER-DRIVEN ACTIONS

- ✓ Hire and train dedicated staff to meet with younger students, connect with more diverse prospective workers, and explore alternative recruitment strategies
- ✓ Create a new branding strategy to more effectively market the utility or organization to younger students and a broader pool of prospective workers
- ✓ Account for workforce needs as part of the budget and capital planning process, while creating more detailed and consistent labor metrics
- ✓ Update or create new job categories to provide greater flexibility for potential applicants
- ✓ Develop competency models—or customize existing models—to promote continued learning and skills development among staff
- ✓ Design and launch new bridge programs, including “water boot camps,” to provide ways for younger workers and other nontraditional workers to explore water careers and gain needed experience
- ✓ Implement a formalized mentorship program to provide interns and younger workers a clear point of contact and better monitor their career progression

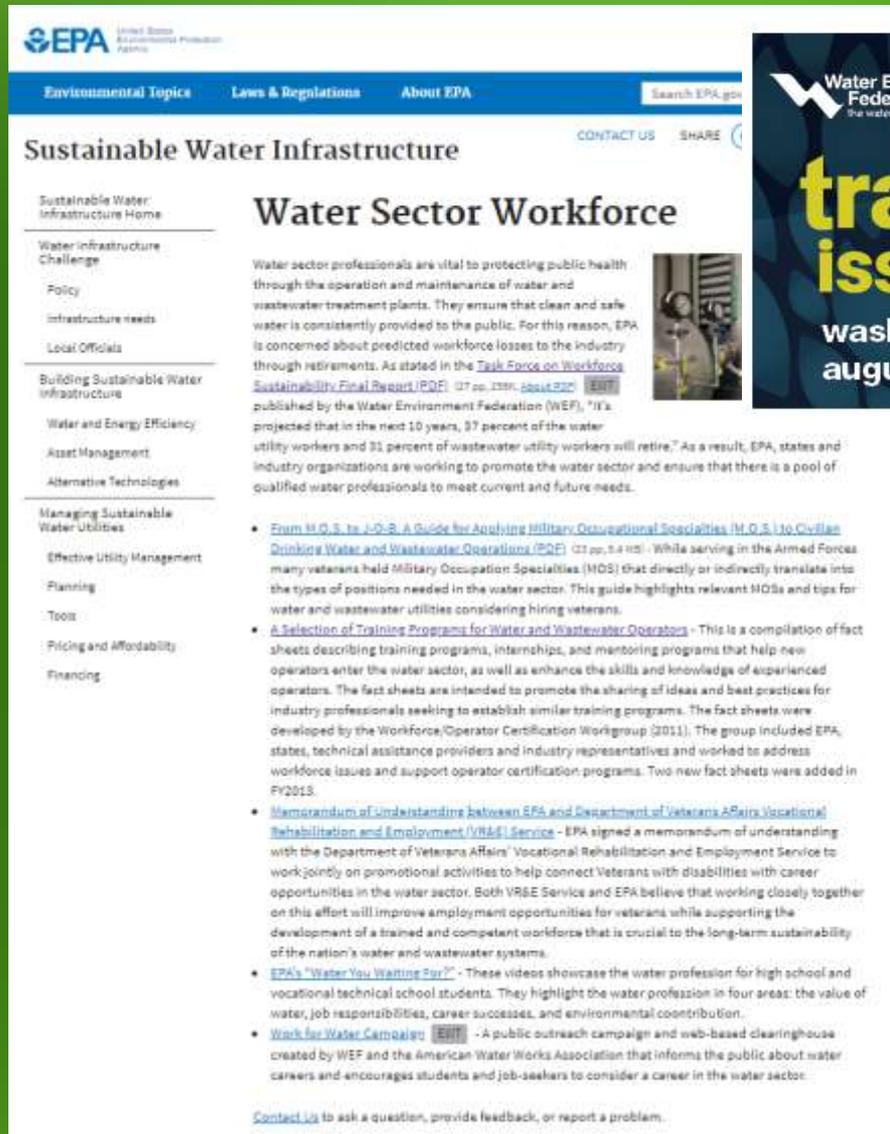
## REGIONAL ACTIONS

- ✓ Establish a common regional point person—or organization—to schedule and steward meetings among a broad range of community partners
- ✓ Organize a regional water summit/meet-and-greet where prospective workers, employers, and community partners can connect with one another regionally
- ✓ Develop a comprehensive water workforce plan, highlighting regional opportunities for additional collaboration
- ✓ Establish a sustainable channel of funding to support these efforts, driven by local government support
- ✓ Increase incentives in support of more minority and women business owners
- ✓ Create a platform to connect water workers and employers, serving as a simple, accessible job postings board
- ✓ Develop a community-designed and run by employers and community partners—in partnership with higher education—infrastructure education, training, and credentials program



# Education & Awareness - Resources

<https://www.epa.gov/sustainable-water-infrastructure/water-sector-workforce>



The screenshot shows the EPA website's 'Sustainable Water Infrastructure' section. The main heading is 'Water Sector Workforce'. Below the heading is a paragraph explaining the importance of water sector professionals and the projected workforce losses. A list of resources follows, including guides for military veterans, training programs, and memorandums of understanding. A 'Contact Us' link is provided at the bottom.

**EPA** United States Environmental Protection Agency

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## Sustainable Water Infrastructure

Sustainable Water Infrastructure Home

Water Infrastructure Challenge

- Policy
- Infrastructure Needs
- Local Officials

Building Sustainable Water Infrastructure

- Water and Energy Efficiency
- Asset Management
- Alternative Technologies

Managing Sustainable Water Utilities

- Effective Utility Management
- Planning
- Tools
- Pricing and Affordability
- Financing

### Water Sector Workforce

Water sector professionals are vital to protecting public health through the operation and maintenance of water and wastewater treatment plants. They ensure that clean and safe water is consistently provided to the public. For this reason, EPA is concerned about predicted workforce losses to the industry through retirements. As stated in the [Task Force on Workforce Sustainability Final Report](#) (PDF) (27 pp, 235K, 2/24/17) [\[PDF\]](#) [\[EXIT\]](#) published by the Water Environment Federation (WEF), "It's projected that in the next 10 years, 37 percent of the water utility workers and 31 percent of wastewater utility workers will retire." As a result, EPA, states and industry organizations are working to promote the water sector and ensure that there is a pool of qualified water professionals to meet current and future needs.



- [From M.O.S. to J.O.B.: A Guide for Analyzing Military Occupational Specialties \(M.O.S.\) to Civilian Drinking Water and Wastewater Operations](#) (PDF) (27 pp, 3.4 MB) - While serving in the Armed Forces many veterans held Military Occupation Specialties (MOS) that directly or indirectly translate into the types of positions needed in the water sector. This guide highlights relevant MOSs and tips for water and wastewater utilities considering hiring veterans.
- [A Selection of Training Programs for Water and Wastewater Operators](#) - This is a compilation of fact sheets describing training programs, internships, and mentoring programs that help new operators enter the water sector, as well as enhance the skills and knowledge of experienced operators. The fact sheets are intended to promote the sharing of ideas and best practices for industry professionals seeking to establish similar training programs. The fact sheets were developed by the Workforce/Operator Certification Workgroup (2011). The group included EPA, states, technical assistance providers and industry representatives and worked to address workforce issues and support operator certification programs. Two new fact sheets were added in FY2015.
- [Memorandum of Understanding between EPA and Department of Veterans Affairs Vocational Rehabilitation and Employment \(VR&E\) Service](#) - EPA signed a memorandum of understanding with the Department of Veterans Affairs' Vocational Rehabilitation and Employment Service to work jointly on promotional activities to help connect Veterans with disabilities with career opportunities in the water sector. Both VR&E Service and EPA believe that working closely together on this effort will improve employment opportunities for veterans while supporting the development of a trained and competent workforce that is crucial to the long-term sustainability of the nation's water and wastewater systems.
- [EPA's "Water You Waiting For?"](#) - These videos showcase the water profession for high school and vocational technical school students. They highlight the water profession in four areas: the value of water, job responsibilities, career successes, and environmental contribution.
- [Work for Water Campaign](#) [\[EXIT\]](#) - A public outreach campaign and web-based clearinghouse created by WEF and the American Water Works Association that informs the public about water careers and encourages students and job-seekers to consider a career in the water sector.

[Contact Us](#) to ask a question, provide feedback, or report a problem.



The poster features a dark blue background with a pattern of white water droplets. The text is in yellow and white. Logos for the Water Environment Federation and the American Water Works Association are at the top. The main title is 'transformative issues symposium' in large yellow letters. Below it, the location and dates are 'washington, dc august 7-9, 2019'. A yellow diagonal banner at the bottom right says 'workforce'.

Water Environment Federation  
the water quality people

American Water Works Association

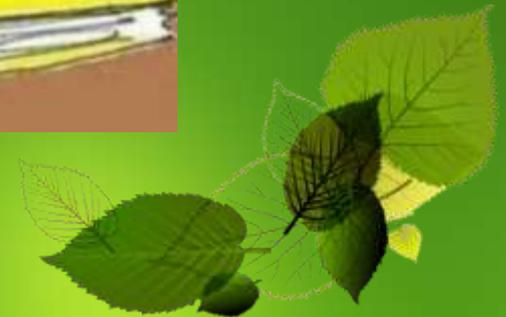
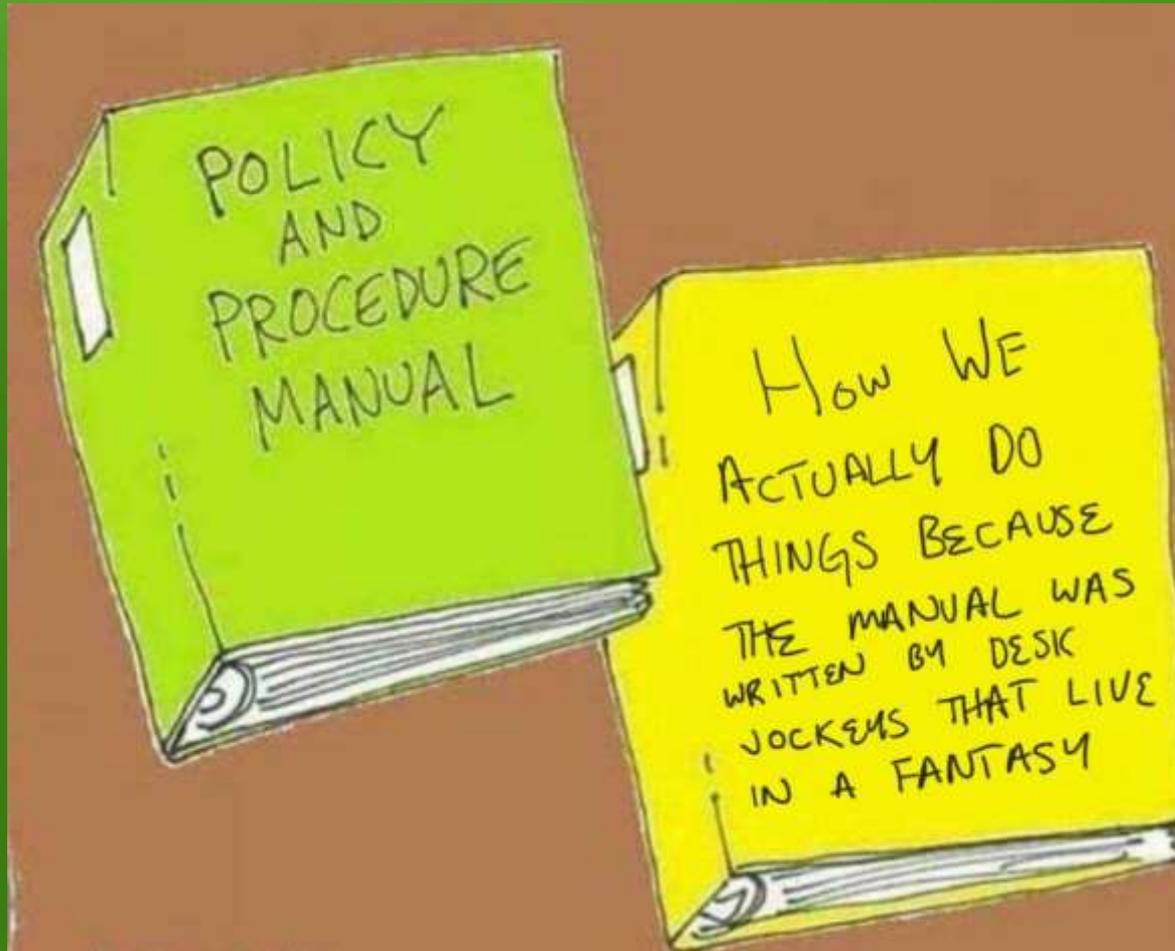
# transformative issues symposium

washington, dc  
august 7-9, 2019

workforce



# How can we impact change?



# POTENTIAL WATER WORKFORCE ACTION AREAS

## 1 Information Platform(s)

Strategic conversations need to continue and existing efforts should be highlighted through conferences, websites, webinars, and social media. Easy-to-access career information should be available online.

## 2 New Information Resources

Planning guides and frameworks are needed for specific topic areas and for utilities of varying sizes. Efforts should emphasize collaboration and integration opportunities between partners.

## 3 Partnership Facilitation

Many partnership models exist, including the notable BAYWORK. Successful partnerships should be leveraged to develop case studies, MOU-type templates, and guides for developing peer-to-peer relationships.

## 4 Identifying Sustainable Funding

There is a need to better coordinate funding across federal agencies as well as to look at alternative funding sources, such as foundations and university endowments, for workforce development programs.

## 5 Campaigns

National initiatives should leverage value of water conversation to create new and consistent workforce-specific messages. Campaigns at smaller scales are finding success with more grassroots-type efforts.

## 6 Blueprint For Replication

Good work is happening across the country and internationally. "Rip off and duplicate" models are needed to facilitate ease of development and implementation of new programs.

# How can we impact change?

## 1. Utilities and other water employers need to empower staff, adjust existing procedures, and pilot new efforts in support of the water workforce

- ✓ Hire and train dedicated staff to meet with younger students, connect with more diverse prospective workers, and explore alternative recruitment strategies
- ✓ Create a new branding strategy to more effectively market the utility or organization to younger students and a broader pool of prospective workers
- ✓ Account for workforce needs as part of the budget and capital planning process, while creating more detailed and consistent labor metrics
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- ✓ Implement a formalized mentorship program to provide interns and younger workers a clear point of contact and better monitor their career progression



# What can I do?

- Mentoring
- Internships/Apprenticeships
- Succession Planning
- Education & Creating Awareness
- Broaden your Geography & Network
- Seek to Understand & Celebrate Individual Qualities



# Millennials!

The millennial workforce is 2x that of GenX at 86M.

What's important to millennials?

Making a positive impact. (Our biggest advantage in the water industry)

Flexibility.

One-on-one time with managers.

Perks.



# In Summary...

Diversity is differences in race, gender, background, experience, education, etc.

Tangible benefits to encouraging diversity in YOUR workforce.

Up to 50% of water workforce will be retiring, creating a vacuum.

Diversity is the future of the workforce





# Thank You

Any questions?

